



October 5, 2021 Capital Links Conference

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DIGITAL ASSETS

# Energy Transition and Crypto Disruption

Jan van Eck, CEO

- Real world themes
- Multi-year
- Difficulty of implementing
- Extreme value and extreme growth



# VanEck Forest Project



# How Do We Avoid a Climate Disaster?

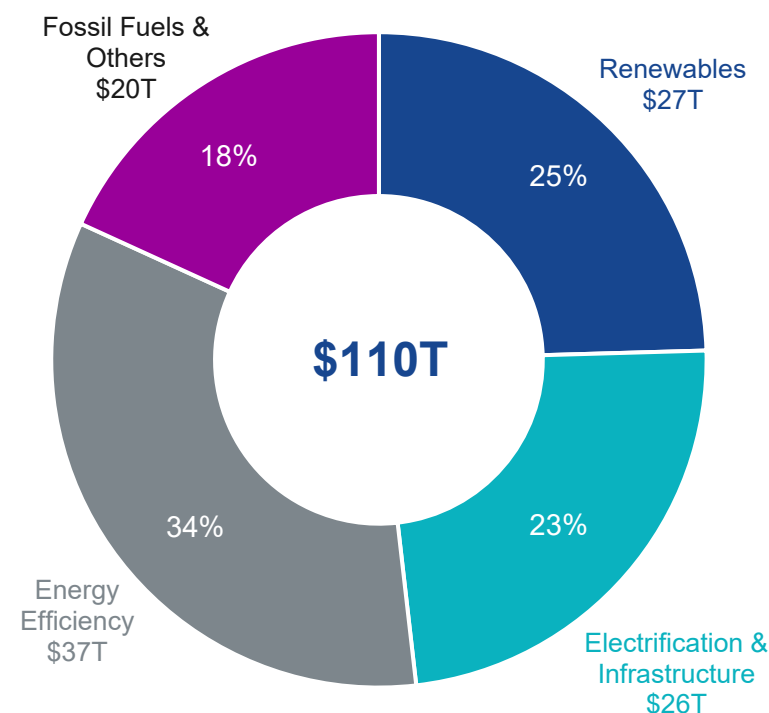
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- Not close to being on path to carbon neutral
- Government policies alone won't get us there, by far
- Need new technology and private sector
- Desire for “green” is leading to big demand increase

# A Multi-Decade Transition In Its Early Beginnings

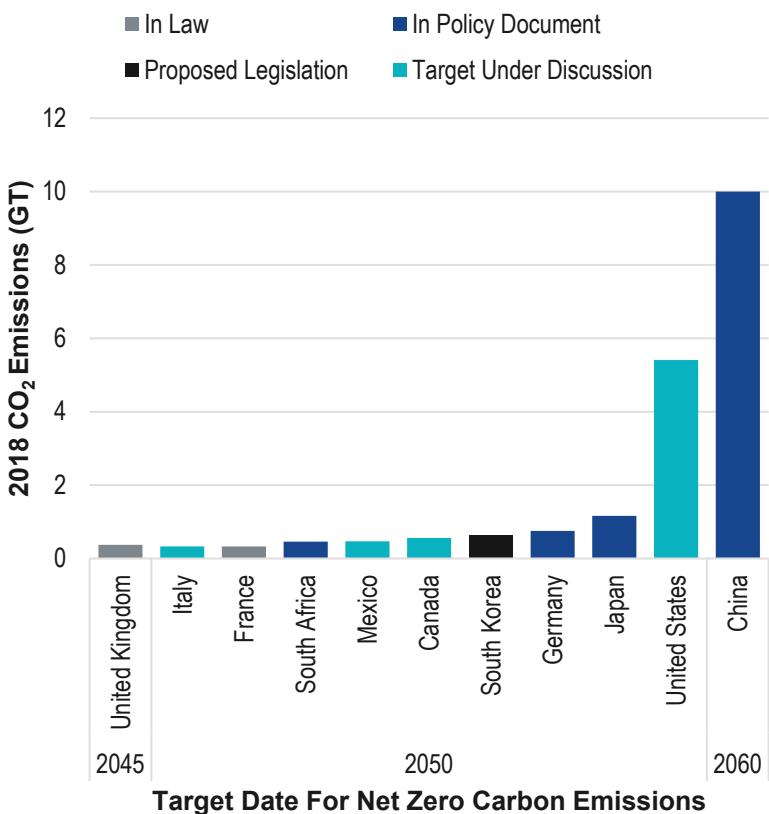
## Cumulative Investments In Renewable Energy

Under An “Ambitious”\* Energy Transition Scenario



## “Net Zero” Carbon Emissions Policies

Target Dates (to “Net Zero”) and Current CO2 Emissions



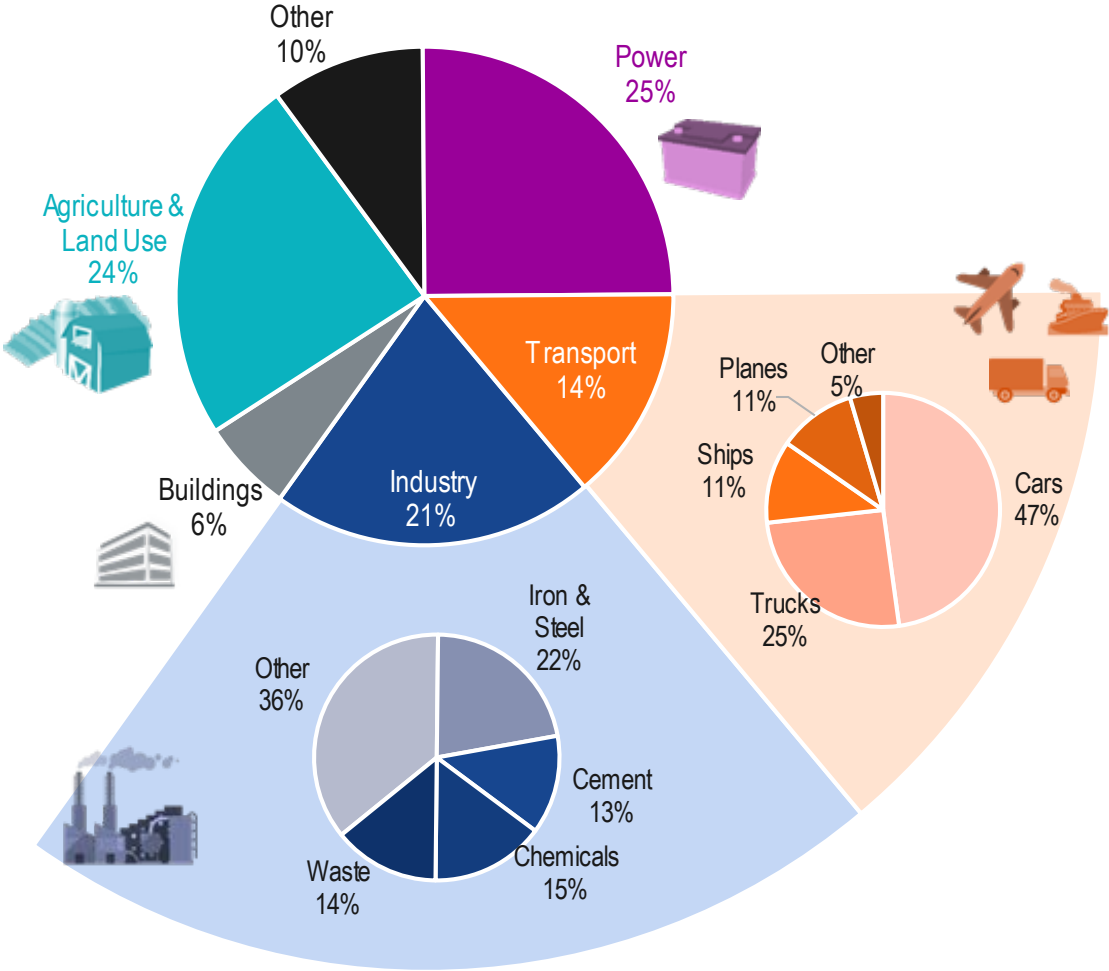
- The outlook for a number of related environmental sustainability industries should be supported by long-term carbon-reduction policies/plans

Source: (left) International Renewable Energy Agency (IRENA), as of April 2020; (right) Energy & Climate Intelligence Unit, as of October 2020. \*Also referred to as the “Transforming Energy Scenario”—an energy transformation pathway based largely on renewable energy sources and steadily improved energy efficiency (though not limited exclusively to these technologies). This would set the energy system on the path needed to keep the rise in global temperatures to well below 2 degree Celsius (°C) and towards 1.5°C during this century.

# Environmental Sustainability Markets: More Than Power, Transport

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Global Emissions by Sector



- The focus on environmental sustainability tends to be primarily on power and transportation, which is likely too narrow in scope

Source: Brookings Institute. Data as of December 2020.

# Food Systems Are Energy Intensive/Inefficient

Energy Flow (Per Year) in U.S. Food System

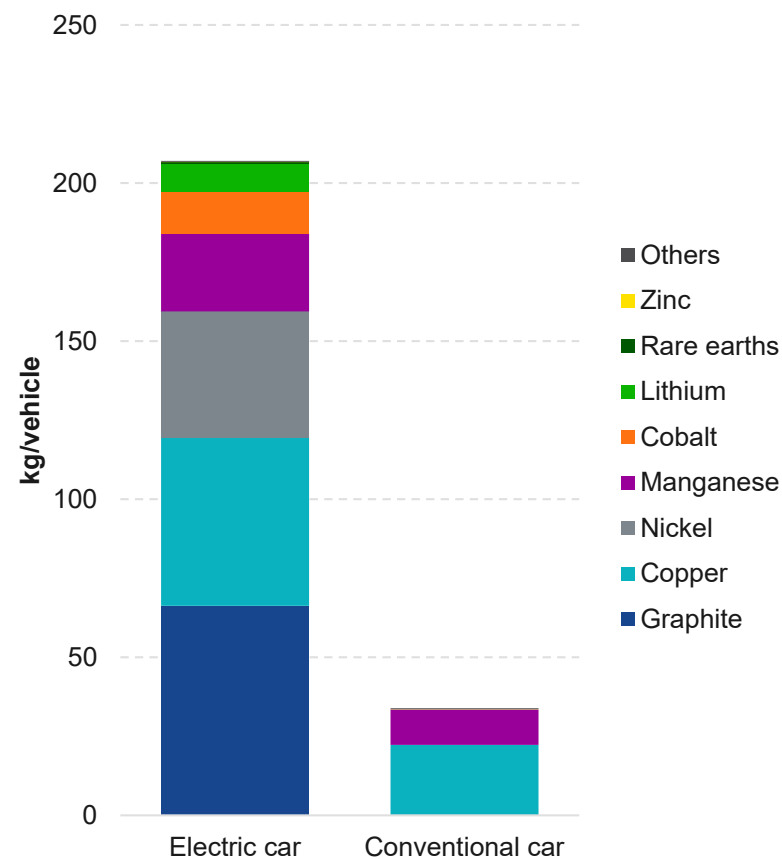


- There is a sizable mismatch between the amount energy required to produce our food and the actual energy available to us from the consumption of that food

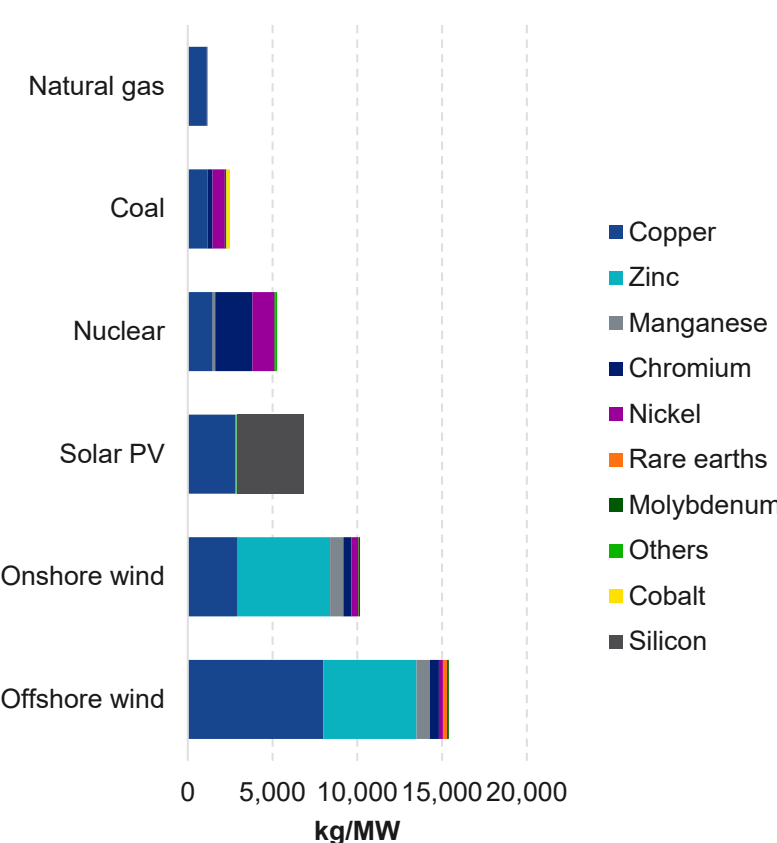
Source: University of Michigan. Data as of December 2020.

# Energy Transitions Are Minerals Intensive/Dependent

Minerals Used in Electric Vehicles (EVs)



Minerals Used in Clean Energy Technologies



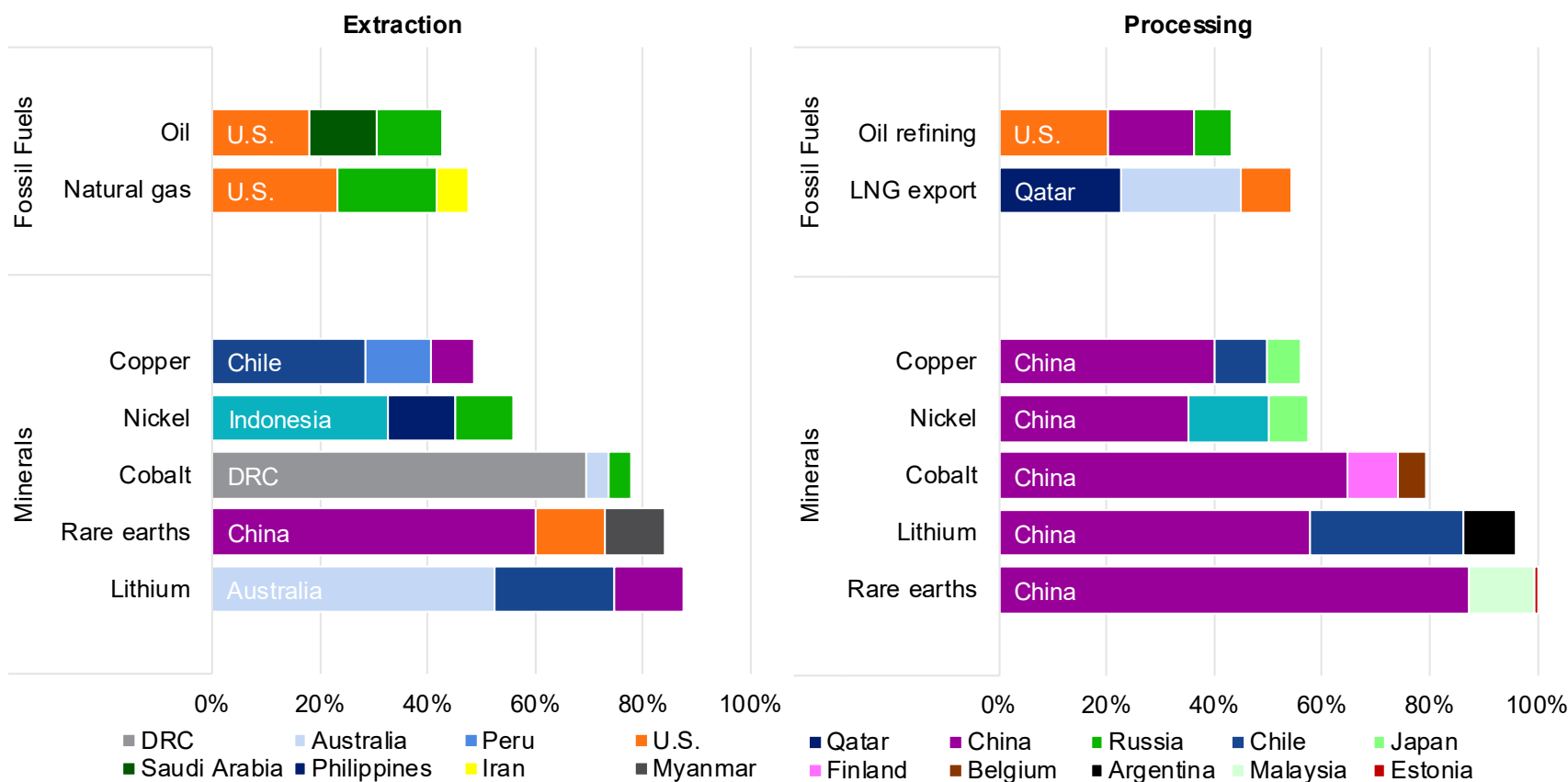
- Mineral usage in clean energy technologies is, on average, four to six times (4-6x) higher relative to conventional energy sources, while EVs require six to eight times (6-8x) more minerals than conventional gas-powered vehicles
- An offshore wind plant, for example, requires thirteen times (13x) more minerals than a similarly-sized gas-fired power plant
- EVs need 60 to 83 kilograms (132 to 183 pounds) of copper whereas conventional cars require only 15 kilograms (33 pounds)
- Fully electric-buses require a whopping 370 kilograms (816 pounds) of copper

Source: International Energy Agency (IEA). Data as of May 2021.



# Sustainability And Security Of Minerals Supply A Concern

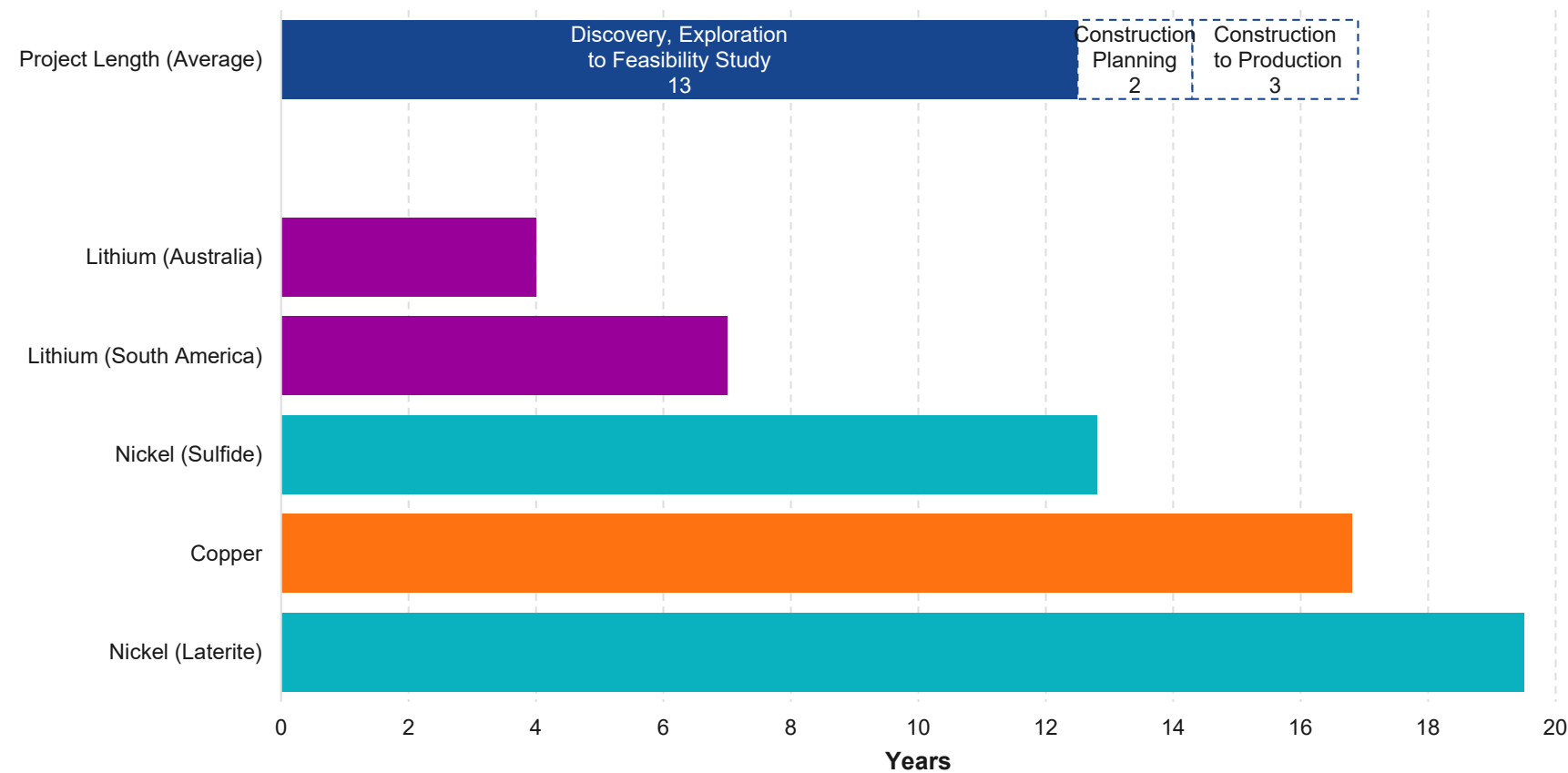
Top 3 Producing Countries of Selected Minerals and Fossil Fuels (2019)



- Consumers and investors are placing a greater emphasis on responsible sourcing of minerals, leading to increased visibility of complex supply chains
- Global concerns are now mounting over the geographic concentration of minerals extraction/processing, which has further lead some governments to incentivize development of onshore supply

# It Can Take A Long Time To Bring On New Supply

Average Mining Project Development Lead Times (From Discovery To Production)



- It may not be a matter of “flipping the switch” to bring on new supply as it can take up to 16-17 years for new mining projects to reach production

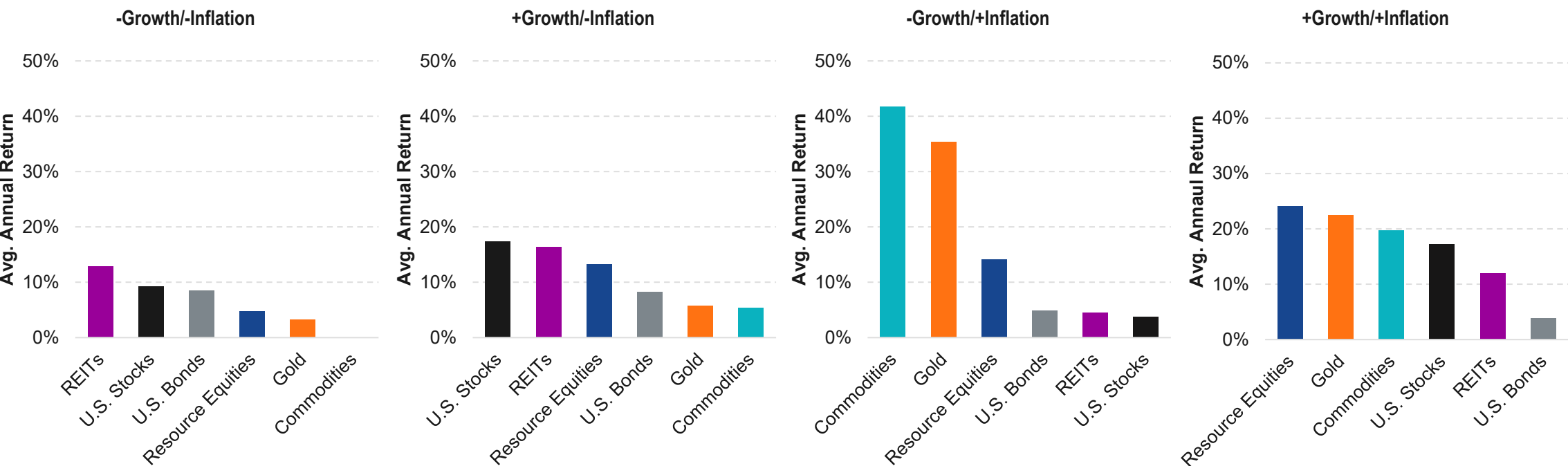
Source: International Energy Agency (IEA). Data as of June 2021.

# Resources, Commodities Can Thrive In Positive Growth, Inflation

## Commodities Have Typically Outperformed Other Asset Classes In Positive Growth + Surprise Inflation Periods

- Commodities have historically outperformed in periods where there was unanticipated inflation
- This outperformance – again, historically – has also been particularly notable in corresponding periods of positive economic growth

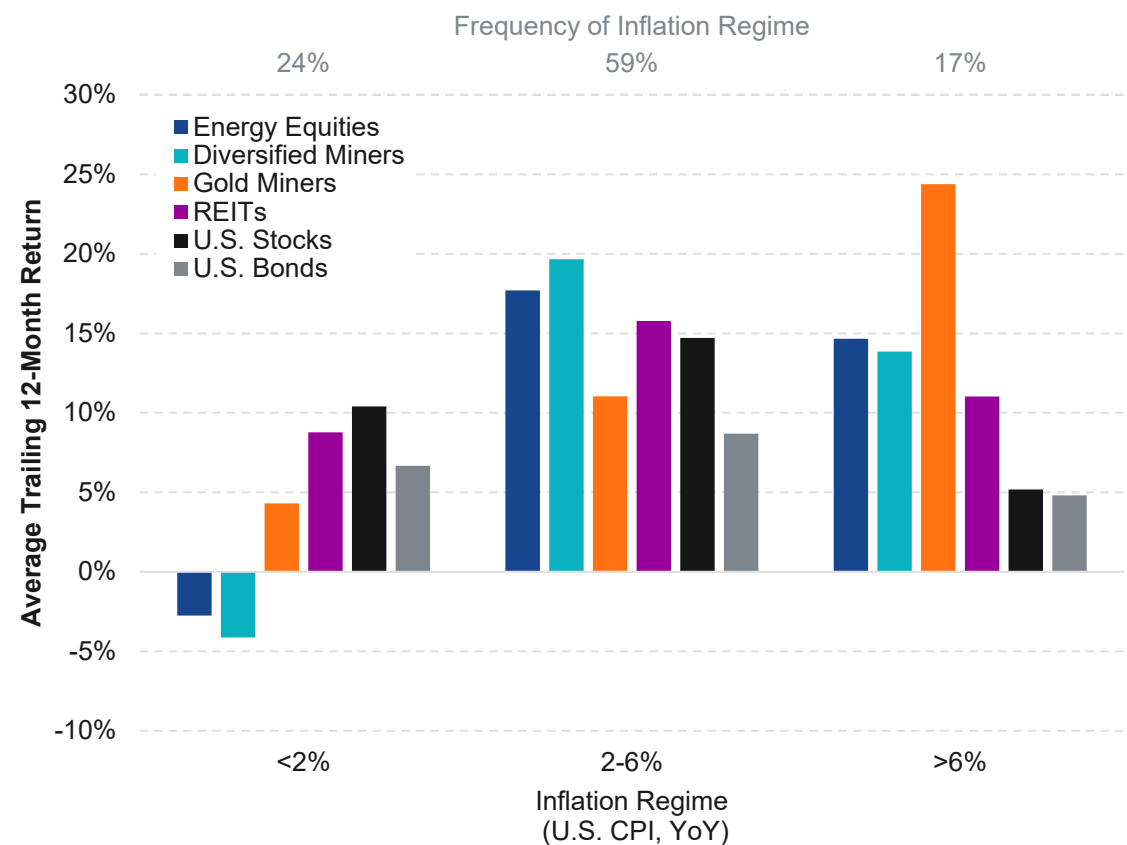
## Average Annual Return in Growth/Inflation Environments (1970 – 2020)



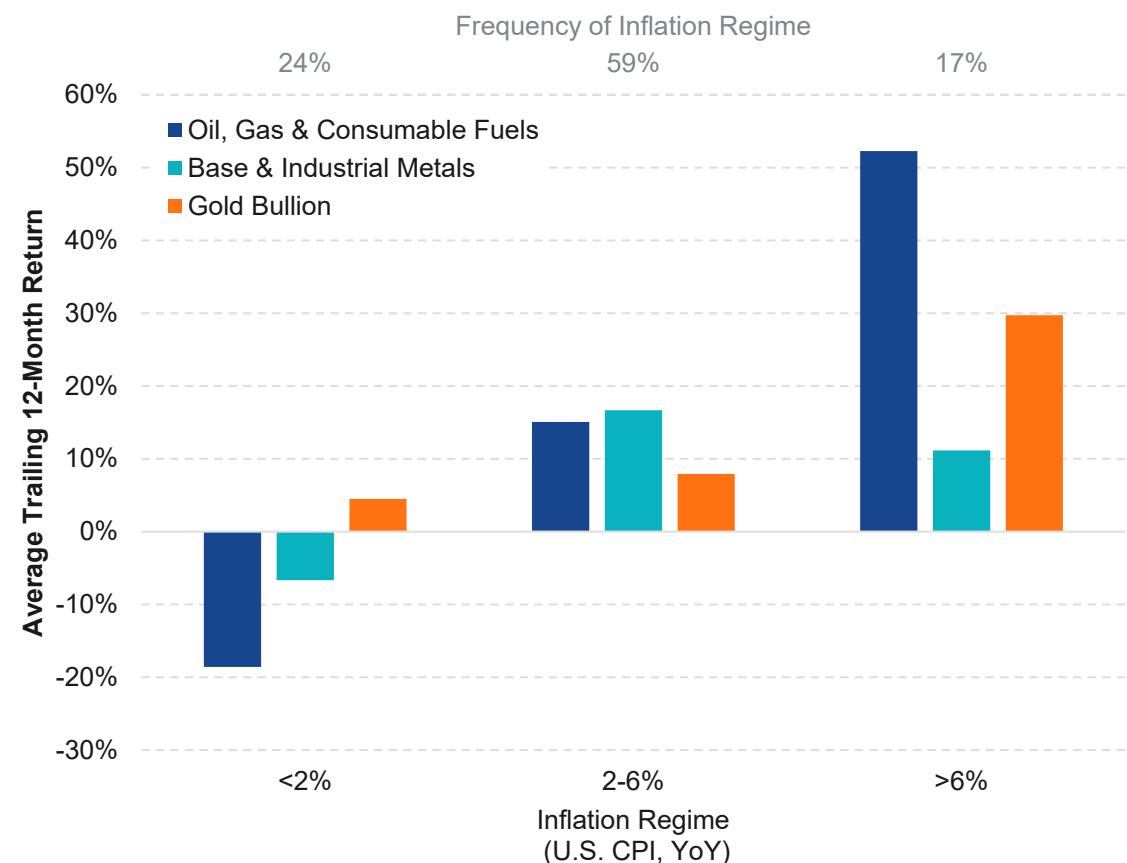
Source: VanEck, CRSP, FactSet, Bloomberg. Data as of December 2020. Past performance is not a guarantee of future results. Please see slide 23 for timeframes, definitions and index descriptions at the end of this presentation.

# Even Modest Inflation May Help Support The Space

Inflation Sensitivity – Resource Equities vs. U.S. Stocks & Bonds



Inflation Sensitivity – Various Commodity Types

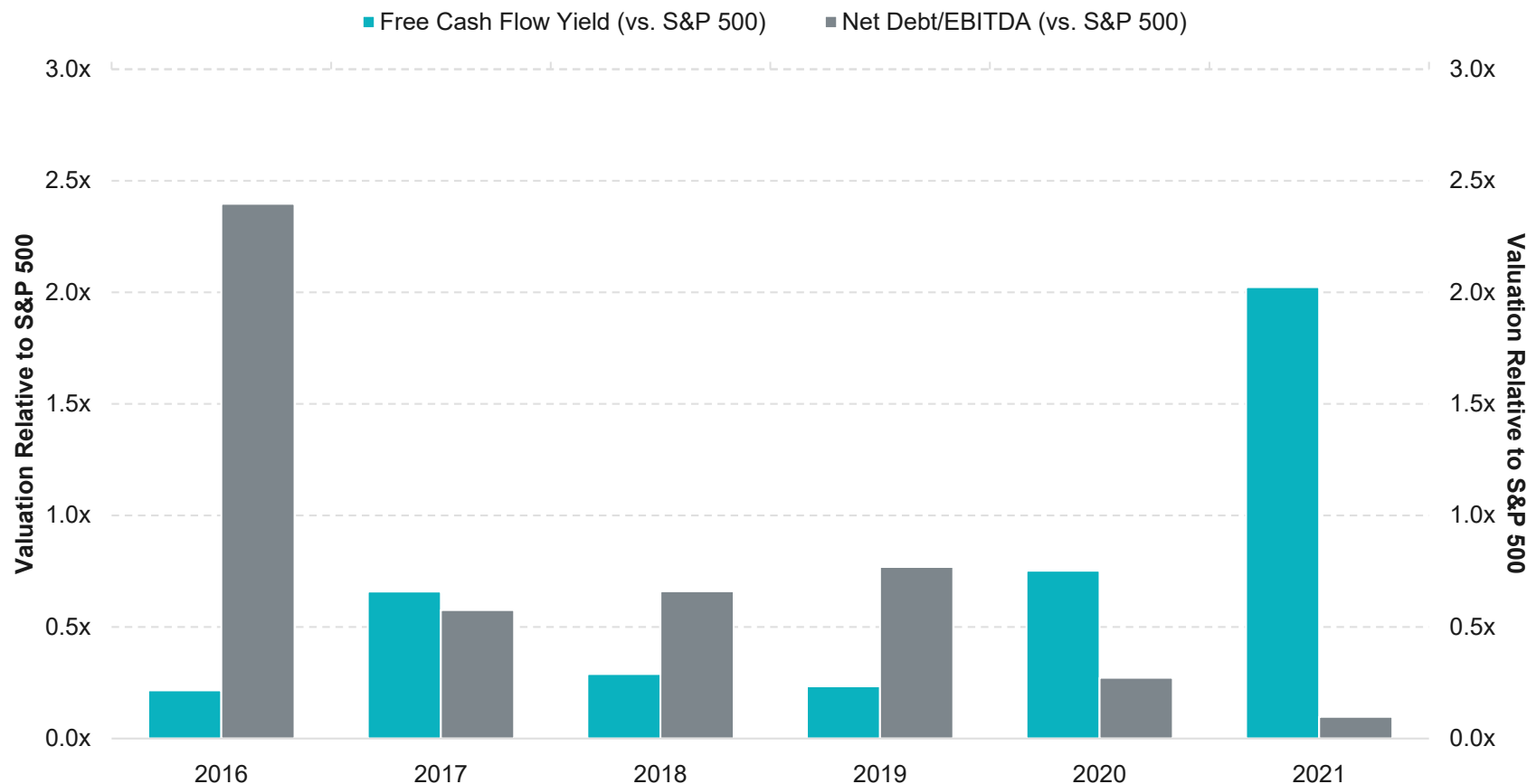


Source: VanEck, FactSet, Bloomberg. Data as of December 2020. Past performance is not a guarantee of future results. Please see slide 24 for timeframes, definitions and index descriptions at the end of this presentation. The Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food, and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them.



# Gold Miners Have Fundamentally Transformed Their Businesses

## Gold Miner Valuations (Relative to S&P 500)\*



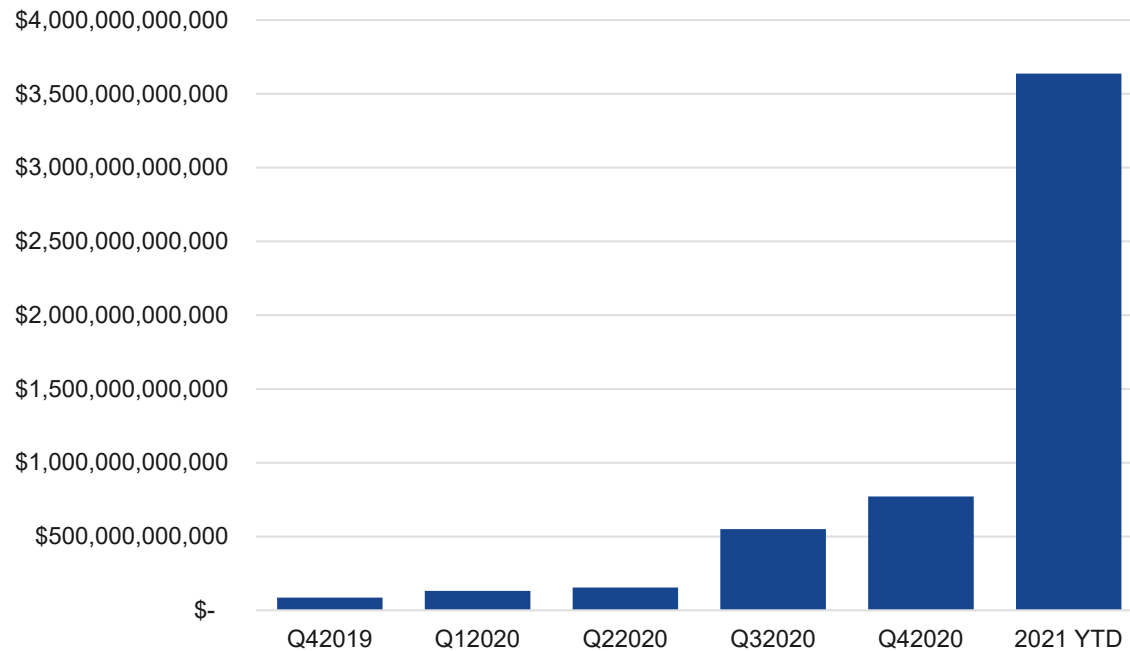
- Gold miners are making a strong case for value investors right now
- A persistent focus on debt reduction and free cash flow generation has fundamentally transformed how these companies look on both an absolute and relative valuation perspective

Source: Bloomberg, VanEck. Data as of July 2021. \*\*Gold Miners" = NYSE Arca Gold Miners Index. "S&P 500" = S&P 500 Index. Index descriptions provided in the disclosures at the end of this presentation. The net debt-to-EBITDA (earnings before interest depreciation and amortization) ratio is a measurement of leverage, calculated as a company's interest-bearing liabilities minus cash or cash equivalents, divided by its EBITDA.

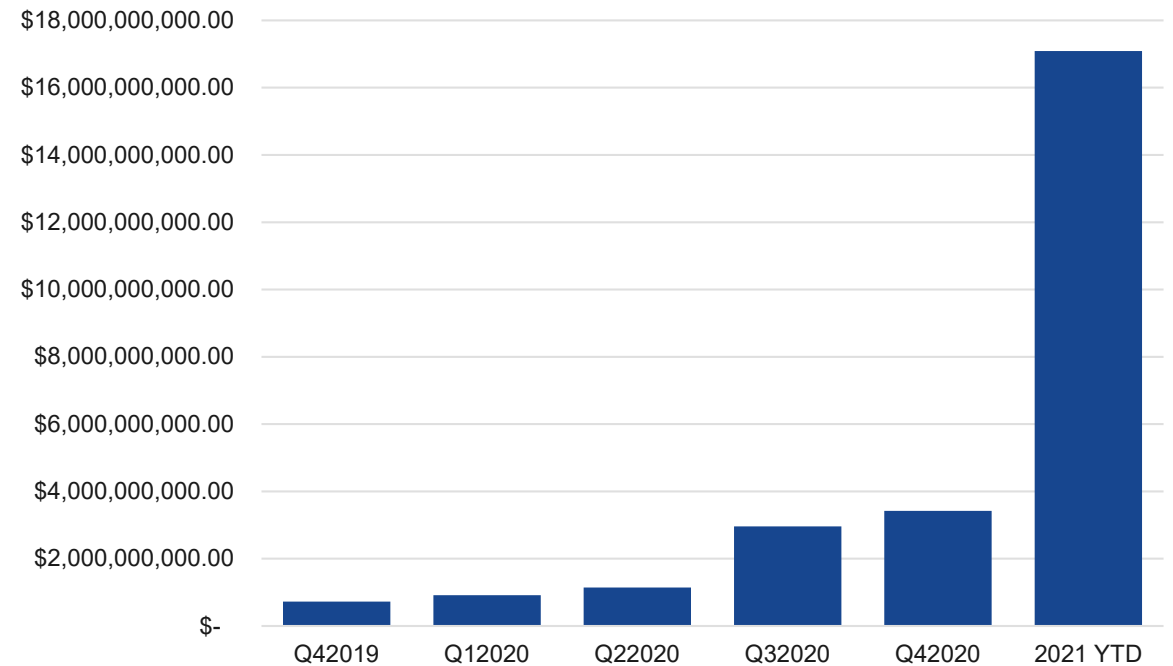
# How Big is Ethereum Right Now?

Ethereum's transaction value and revenues have ballooned

Total value of transactions on Ethereum network (annualized)



Ethereum revenues (annualized)



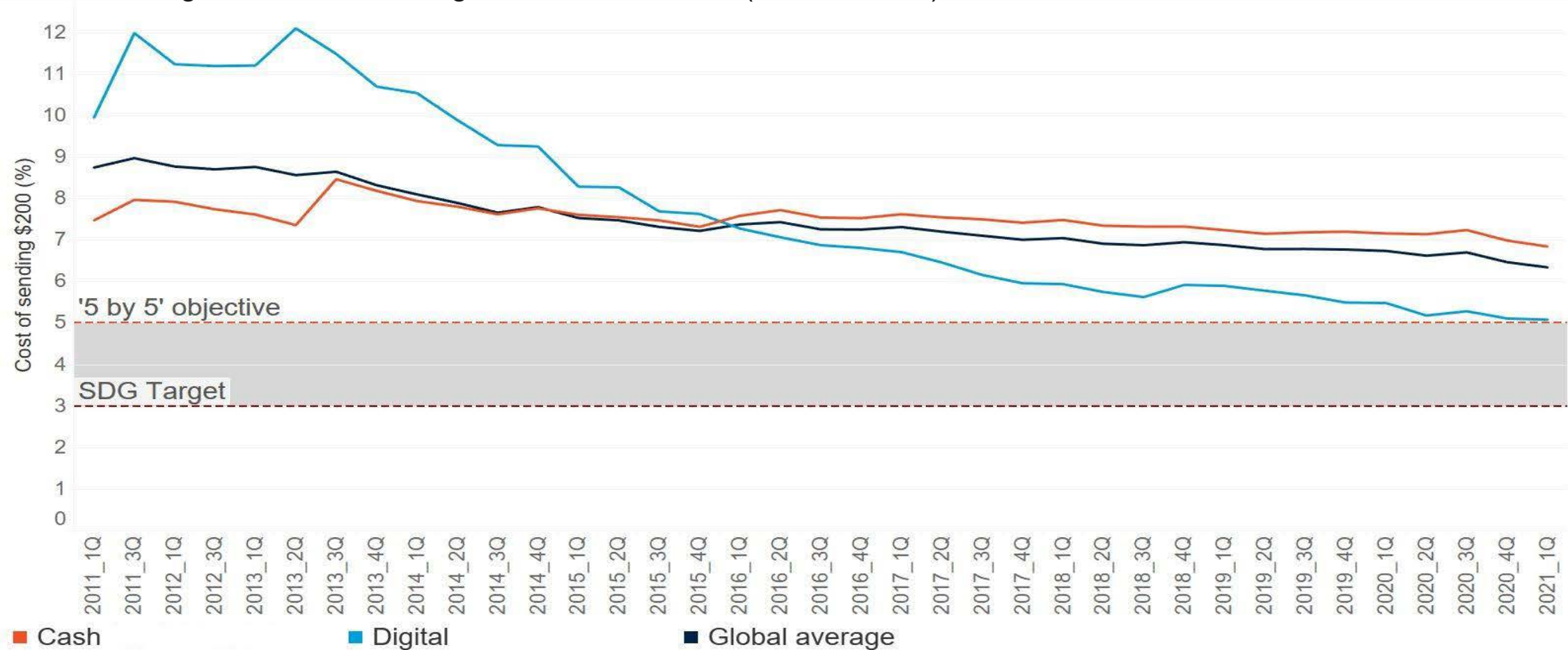
## Finance is being disrupted in three areas

- Brokerage & exchanges
  - Advantages: instantaneous transactions, operate 24/7, cheaper data costs
  - Coinbase \$53B vs Nasdaq \$29B<sup>1</sup>
- Payments
  - Advantages: instantaneous transactions, operate 24/7, lowest cost and potentially lower fraud than traditional systems
  - Over \$100B in stablecoin assets.<sup>2</sup> Circle (USDC) to go public
  - Eg Bitso (Mexico's largest crypto exchange): 50% of Mexicans have a bank account,<sup>3</sup> 85% have phones,<sup>4</sup> 90% cost savings,<sup>5</sup> race to zero on fees
- Banking & lending
  - Advantages: automated collateralization, automated credit scores (live adjustments), automated liquidation
  - “DeFi Summer of 2020”; \$56B total value locked;<sup>6</sup> the leader (first to go public) not clear
  - Lending to intermediaries

<sup>1</sup> Source: FactSet. Data as of 6/30/2021. <sup>2</sup> Source: Coinmetrics. Data as of 6/30/2021. <sup>3</sup> Source: [Worldbank](#). Data as of 2017. <sup>4</sup> Source: [GSM Association](#). Data as of 2020. <sup>5</sup> Source: VanEck calculations based on average 6.5% remittance fees. <sup>6</sup> Source: [Cointelegraph](#). Data as of 3/11/2021.

# Can Crypto Help Crash the 5% Cost Barrier?

Trends in the global cost of sending \$200 in remittances (from UN data)



Source: The World Bank

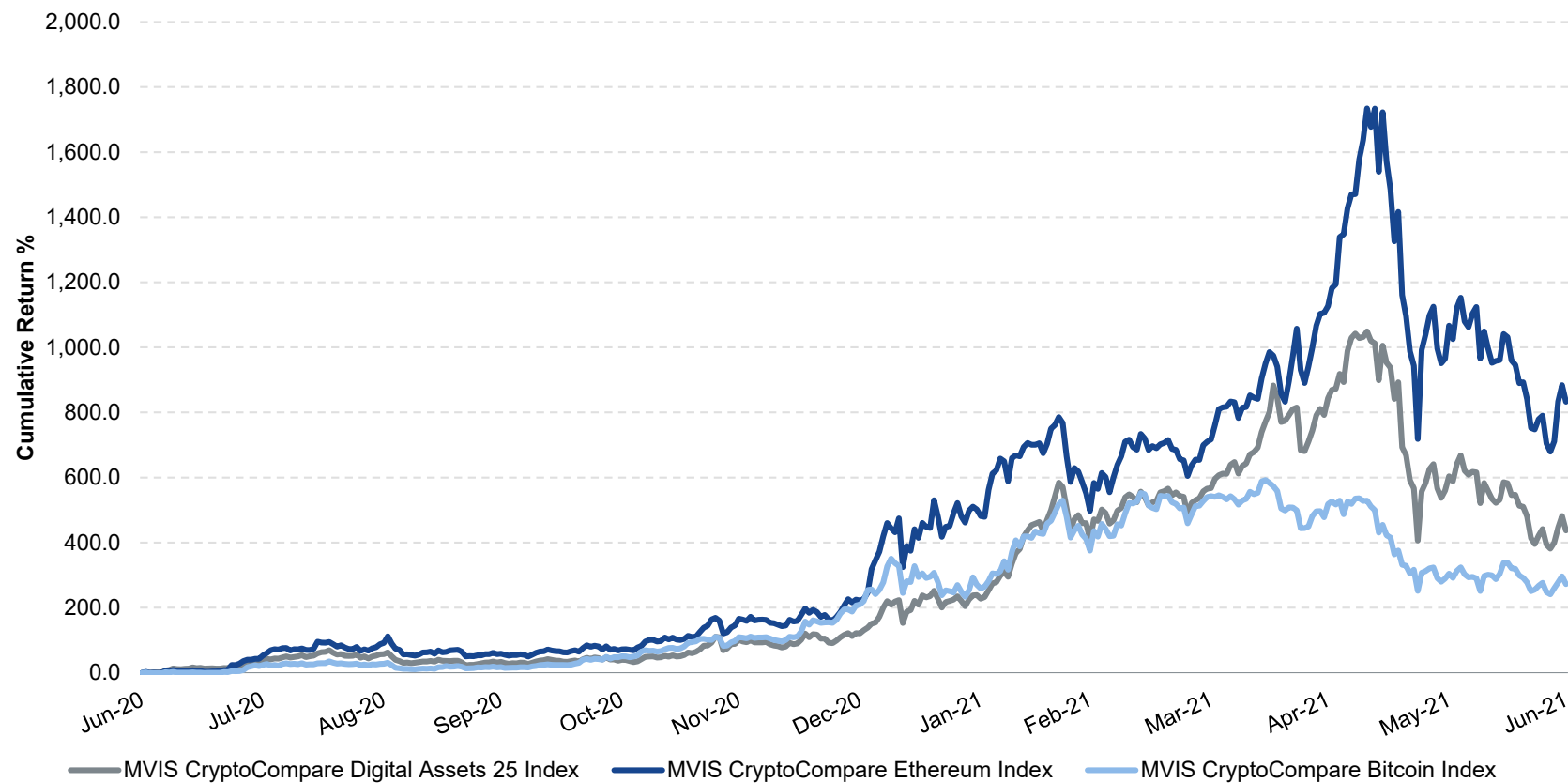
'5 by 5' objective is a term that was adopted by the G8 in 2009 and refers to the reduction of the global average total cost of migrant remittances by 5 percentage points in 5 years.

SDG refers to the Sustainable Development Goals, which are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The 5% Cost Barrier is G8 and G20 commitment to reduce the Global Average Total Cost of sending \$200 to 5%



# Smart Contract Blockchains are Outperforming

7/1/2020 – 6/30/2021



Source: Morningstar. Data as of 6/30/2021. Investors cannot invest directly in an index. Please see index descriptions at the end of the presentation. Past performance is no guarantee of future results. MVIS CryptoCompare Digital Assets 25 Index is a modified market cap-weighted index which tracks the performance of the 25 largest and most liquid digital assets. MVIS CryptoCompare Ethereum Index covers the performance of a digital assets portfolio which invests in Ethereum. MVIS CryptoCompare Bitcoin Index measures the performance of a digital assets portfolio which invests in Bitcoin.

- Real world themes
- Multi-year
- Difficulty of implementing
- Get over it — dollar cost average!

# Index Description and Definitions

Index returns assume reinvestment of all income and do not reflect any management fees or brokerage expenses associated with fund returns. Returns for actual fund investors may differ from what is shown because of differences in timing, the amount invested and fees and expenses. You cannot invest directly in an index.

**MVIS Global Digital Assets Equity Index:** intends to track the largest and most liquid companies in the digital assets segment.

**Digital Transformation Company:** companies (i) that operate digital asset exchanges, operate payment gateways (i.e., a merchant service that authorizes direct payments processing for businesses), engage in and/or assist with the digital asset mining operations, provide software services, equipment and technology or services to digital asset operations, operate digital asset infrastructure businesses, or facilitate commerce with the use of digital assets (these items are collectively referred to herein as “digital asset projects”) and/or (ii) that own a material amount of digital assets or otherwise generate revenues related to digital asset projects.

**Stablecoin:** cryptocurrencies where the price is designed to be pegged to a cryptocurrency, fiat money, or to exchange-traded commodities

**Digital Asset:** anything that exists in a digital format and comes with the right to use. Data that do not possess that right are not considered assets

**HODLER:** crypto investors who buy and hold their positions regardless of price

**Decentralized Application:** computer applications that run on a distributed computing system.

**Blockchain:** a decentralized, distributed, and oftentimes public, digital ledger consisting of records called blocks that is used to record transactions across many computers so that any involved block cannot be altered retroactively, without the alteration of all subsequent blocks.

**Cryptocurrency:** digital or virtual currency that is secured by cryptography, which makes it nearly impossible to counterfeit or double-spend. Many cryptocurrencies are decentralized networks based on blockchain technology—a distributed ledger enforced by a disparate network of computers.

**Non-Fungible Token (NFT):** A digital file whose unique identity and ownership are verified on a blockchain.

**Internet of Things:** the network of physical objects—“things” or objects—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet

**Pure-play digital asset company:** as determined by the index provider, companies which (i) generate at least 50% of its revenues from digital assets projects; (ii) generate at least 50% of its revenues from projects that, when developed, have the potential to generate at least 50% of their revenues from the digital assets industry; and/or (iii) have at least 50% of its assets invested in direct digital asset holdings or digital asset projects.

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ICE US Fallen Angel High Yield 10% Constrained Index is comprised of below investment grade corporate bonds denominated in U.S. dollars, issued in the U.S. domestic market and that were rated investment grade at the time of issuance. ICE BofA Diversified High Yield US Emerging Markets Corporate Plus Index is comprised of U.S. dollar-denominated bonds issued by non-sovereign emerging markets issuers that are rated below investment grade and that are issued in the major domestic and Eurobond markets. MVIS US Business Development Companies Index tracks the overall performance of publicly traded business development companies. MVIS North America Energy Infrastructure Index is intended to track the overall performance of North American companies involved in the midstream energy segment, which includes MLPs, and corporations involved in oil and gas storage and transportation. JPMorgan EM High Yield Bond Index is comprised of U.S. dollar-denominated, emerging market high yield sovereign and corporate bonds. US Corporate High Yield Bond Index is designed to track the performance of U.S. dollar-denominated, high-yield corporate bonds issued by companies whose country of risk use official G-10 currencies. Dow Jones REIT Index is designed to provide a measure of real estate securities that serve as proxies for direct real estate investment. S&P MLP Index provides exposure to both master limited partnerships (MLPs) and publicly traded limited liability companies (LLCs). MVIS CryptoCompare Digital Assets 25 Index is a modified market cap-weighted index which tracks the performance of the 25 largest and most liquid digital assets. MVIS CryptoCompare Ethereum Index covers the performance of a digital assets portfolio which invests in Ethereum. MVIS CryptoCompare Bitcoin Index measures the performance of a digital assets portfolio which invests in Bitcoin.

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Cryptocurrency is a digital representation of value that functions as a medium of exchange, a unit of account, or a store of value, but it does not have legal tender status. Cryptocurrencies are sometimes exchanged for U.S. dollars or other currencies around the world, but they are not generally backed or supported by any government or central bank. **Their value is completely derived by market forces of supply and demand, and they are more volatile than traditional currencies. The value of cryptocurrency may be derived from the continued willingness of market participants to exchange fiat currency for cryptocurrency, which may result in the potential for permanent and total loss of value of a particular cryptocurrency should the market for that cryptocurrency disappear.** Cryptocurrencies are not covered by either FDIC or SIPC insurance.

Investing in cryptocurrencies comes with a number of risks, including volatile market price swings or flash crashes, market manipulation, and cybersecurity risks. In addition, cryptocurrency markets and exchanges are not regulated with the same controls or customer protections available in equity, option, futures, or foreign exchange investing. There is no assurance that a person who accepts a cryptocurrency as payment today will continue to do so in the future.

The features, functions, characteristics, operation, use and other properties of the specific cryptocurrency may be complex, technical, or difficult to understand or evaluate. The cryptocurrency may be vulnerable to attacks on the security, integrity or operation, including attacks using computing power sufficient to overwhelm the normal operation of the cryptocurrency's blockchain or other underlying technology. Some cryptocurrency transactions will be deemed to be made when recorded on a public ledger, which is not necessarily the date or time that a transaction may have been initiated.

- Investors must have the financial ability, sophistication and willingness to bear the risks of an investment and a potential total loss of their entire investment in cryptocurrency.
- An investment in cryptocurrency is not suitable or desirable for all investors.
- Cryptocurrency has limited operating history or performance.
- Fees and expenses associated with a cryptocurrency investment may be substantial.

**There may be risks posed by the lack of regulation for cryptocurrencies and any future regulatory developments could affect the viability and expansion of the use of cryptocurrencies. Investors should conduct extensive research before investing in cryptocurrencies. Past performance is not a guarantee of future results**

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## Growth & Inflation (Slides 11 & 12)

“**Base & Industrial Metals**” represented by S&P GSCI Industrial Metals Index from January 1977 to December 2020 and CRB Commodity Metals Index from January 1970 to December 1976. “**Commodities**” represented by Bloomberg Commodity Index. “**Diversified Miners**” represented by MSCI ACWI Select Metals & Mining ex. Gold & Silver Index from September 2001 to December 2020, EMIX Global Mining ex. Gold & Energy Index from January 1986 to August 2001, and CRSP’s Industry Portfolio (Mines) from January 1970 to December 1985. “**Energy Equities**” represented by S&P Global BMI Energy (Sector) Index from August 1989 to December 2020, EMIX Global Energy Index from January 1986 to July 1989 and CRSP’s Industry Portfolio (Energy) from January 1970 to December 1985. “**Gold (Bullion)**” represented by NYMEX spot gold price in \$US/oz. “**Gold Miners**” represented by NYSE Arca Gold Miners Index from October 1993 to December 2020, Dow Jones Global Indexes All World Gold Mining (Sub-Industry) Index from February 1992 to September 1993, S&P 500 Gold (Sub-Industry) index from October 1989 to January 1992 and CRSP’s Industry Portfolio (Gold) from January 1970 to September 1989. “**Natural Resource Equities**” represented by S&P Global Natural Resources Index from December 2012 to December 2020, an equal-weighted blend of returns for S&P Global BMI Energy and Materials (Sector) indices from August 1989 to November 2012, an equal-weighted blend of returns for EMIX Global Energy and Global Mining indices from January 1986 to July 1989 and a blend of returns for CRSP’s Industry Portfolios (50% Energy, 10% Mines, 10% Chemicals, 10% Wood, 10% Boxes and 10% Agriculture) from January 1970 to December 1985. “**Oil, Gas & Consumable Fuels**” represented by World Bank Energy Price Index. “**REITs**” represented by FTSE NAREIT All Equity REITs Index from January 1972 to December 2020. “**U.S. Bonds**” represented by Bloomberg Barclays U.S. Aggregate Bond Index from March 1976 to December 2020, Bloomberg Barclays U.S. Aggregate Government/Credit Index from March 1973 to February 1976 and a blend of returns of Ibbotson SBBI bond indices (70% U.S. Intermediate-Term Government Bond Index and 30% U.S. Long-Term Corporate Bond Index) from January 1970 to February 1973. “**U.S. Stocks**” represented by S&P 500 Index.

For Slide 11, “**Surprise Inflation**” determined by quarters where a year-over-year percent change in inflation (as measured by U.S. Consumer Price Index for All Urban Consumers - CPI-U) was higher than 1-year-ahead forecasts from Philadelphia Federal Reserve Bank’s Survey of Professional Forecasters (from January 1970 to December 1977) and University of Michigan’s inflation expectations survey (from January 1978 to December 2020). For Slides 13 and 14, global growth measured by periods where World Bank’s real global GDP growth (year-over-year % change) was greater than the prior year.